PHYSICAL ENVIRONMENT

3.9 Hydrology and Floodplains

3.9.1 Regulatory Setting

Executive Order (EO) 11988 (Floodplain Management) directs all federal agencies to refrain from conducting, supporting, or allowing actions in floodplains unless it is the only practicable alternative. The Federal Highway Administration (FHWA) requirements for compliance are outlined in 23 Code of Federal Regulations (CFR) 650 Subpart A.

To comply, the following must be analyzed:

- The practicability of alternatives to any longitudinal encroachments.
- Risks of the action.
- Impacts on natural and beneficial floodplain values.
- Support of incompatible floodplain development.
- Measures to minimize floodplain impacts and to preserve/restore any beneficial floodplain values impacted by the project.

The base floodplain is defined as "the area subject to flooding by the flood or tide having a one percent chance of being exceeded in any given year." An encroachment is defined as "an action within the limits of the base floodplain."

3.9.2 Affected Environment

The information in this section is based on the Summary Floodplain Encroachment Report (September 2011), Final Preliminary Hydraulic Report, San Jacinto North Segment (April 2007), Final Location Hydraulic Study, San Jacinto South Segment (April 2007), Final Location Hydraulic Study, Perris Valley Storm Drain Bridge (April 2007), and Final Location Hydraulic Study, San Jacinto Bridge at Lakeview (September 2011).

3.9.2.1 Watershed Description

The project site is located in Riverside County within the San Jacinto Valley Watershed as shown on Figure 3.9.1. The San Jacinto River Watershed is divided into hydrologic areas that are subdivided into hydrologic subareas. The purpose of hydrologic boundaries is to designate the area within a larger watershed that drains in a particular direction to a particular water body. The project area lies within the Perris

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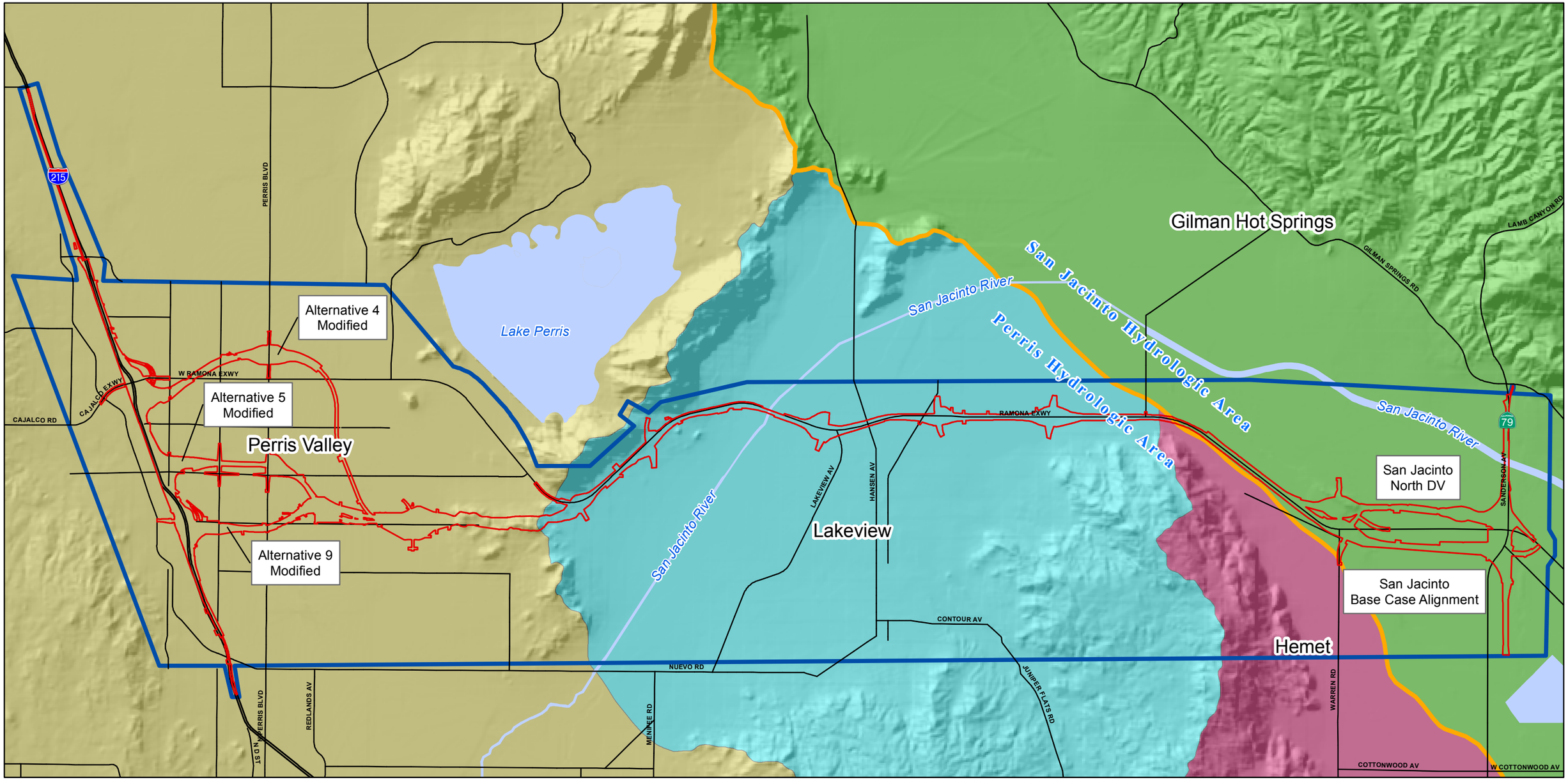

LEGEND

- MCP Study Area
- Limits of Proposed Improvements (All Alternatives and Design Variations)
- Hydrologic Area Boundary

Perris Hydrologic Area

- Hemet Hydrologic Subarea
- Lakeview Hydrologic Subarea
- Perris Valley Hydrologic Subarea

San Jacinto Hydrologic Area

- Gilman Hot Springs Hydrologic Subarea

FIGURE 3.9.1

SOURCE: Jacobs Engineering (02/2011); Calwaters (11/2004); Thomas Brothers (2010)

0 0.5 1 Miles

Watershed Boundaries

08-RIV-MCP PM 0.0/16.3; 08-RIV-215 PM 28.0/34.3
EA 08-0F3200 (PN 0800000125)

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Valley, Lakeview, and Hemet hydrologic subareas of the Perris hydrologic area, and the Gilman Hot Springs hydrologic subarea of the San Jacinto hydrologic area.

The San Jacinto River Watershed is approximately 780 square miles (sq mi) and extends about 59 miles (mi) from its headwaters in the San Jacinto Mountains to where it drains into Canyon Lake and then into Lake Elsinore. On rare occasions, Lake Elsinore overflows into Temescal Creek, which ultimately flows to the Santa Ana River. During dry periods, the San Jacinto River is essentially dry, contributing little or no flow to Canyon Lake. Typical flows range from 16 cubic feet per second (cfs) in the winter to less than 1 cfs during the dry season. Also within the San Jacinto Watershed is Lake Perris, a 2,320-acre man-made reservoir that marks the southern end of the State Water Project aqueduct system. Within the project area, surface water drains to the San Jacinto River, which generally flows east to west within the project area.

3.9.2.2 Floodplain Description

The Federal Emergency Management Agency (FEMA) has prepared Flood Insurance Rate Maps (FIRMs) that delineate flood zones based on estimated flood risk. According to FEMA FIRM Nos. 06065C1430G, 06065C1435G, 06065C1455G, 06065C1460G, and 06065C1470G (August 28, 2008), the project alignment crosses the Perris Valley Storm Drain and the San Jacinto River floodplains/floodways. These floodplains/floodways are described in detail below. Figure 3.9.2 presents an overview of the 100-year FEMA-mapped floodplains/floodways within the MCP study area.

Perris Valley Storm Drain

The Perris Valley Storm Drain collects runoff from the city of Moreno Valley, the city of Perris, and parts of unincorporated Riverside County. The Perris Valley Storm Drain is a tributary to the San Jacinto River. The total tributary drainage area collected at the project site is approximately 85 sq mi. Topographical relief ranges from steep foothill terrain to very mild sloping valley terrain.

South of Ramona Expressway, the Perris Valley Storm Drain is within a mapped Zone AE (special flood hazard areas subject to inundation by the 1 percent annual chance flood with base flood elevations determined) and shaded Zone X (areas of 0.2 percent annual chance flood, areas of 1 percent annual chance flood with average depths of less than 1 foot (ft) or with drainage areas less than 1 sq mi, and areas protected by levees from 1 percent annual chance flood). Portions of the Perris Valley

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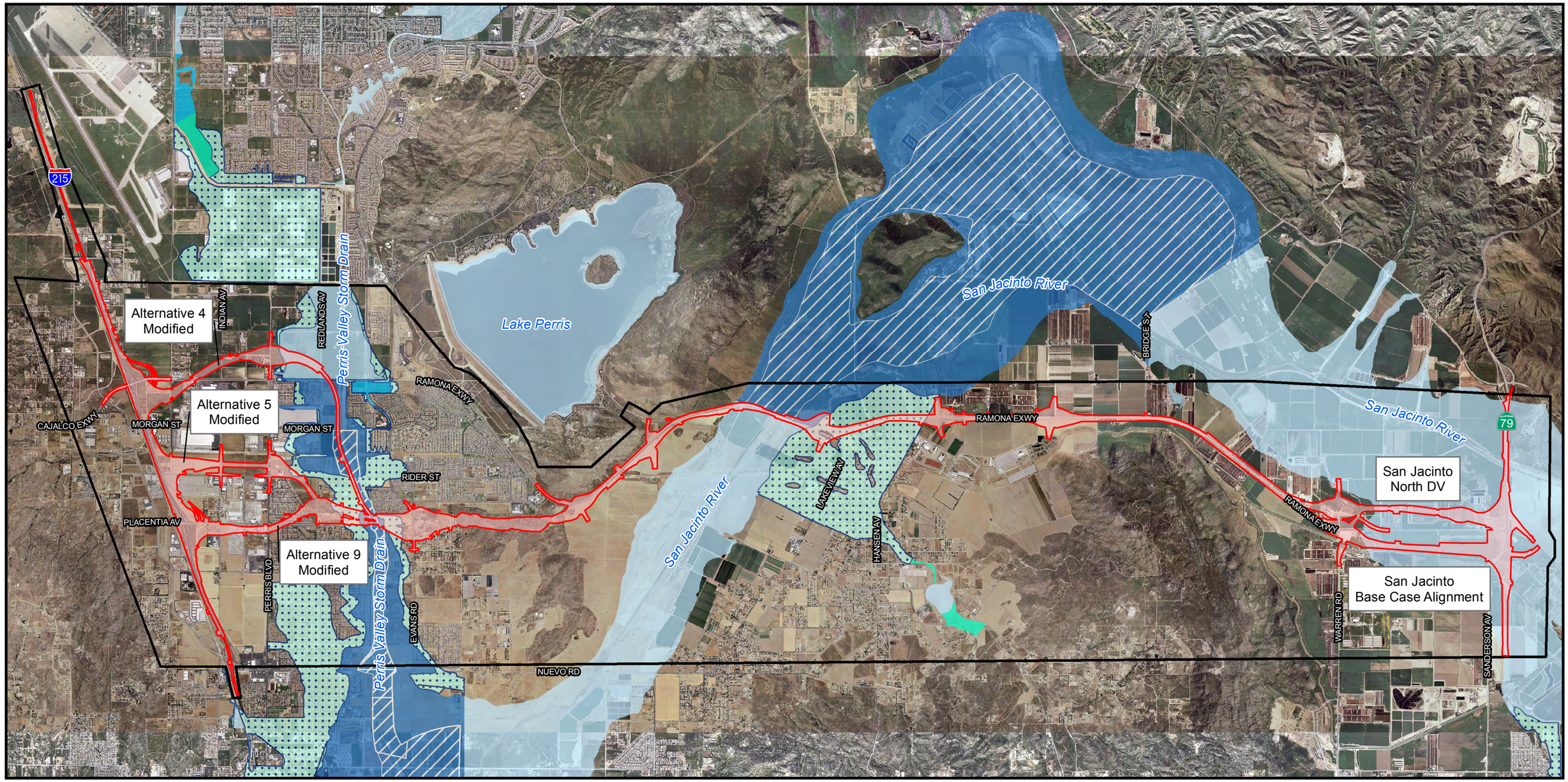

LEGEND

- Limits of Improvements (All Alternatives and Design Variations)
- Study Area

100-Year Floodplain

- Zone A
- Zone AE
- Zone AH
- Zone AO
- Floodway

500-Year Floodplain; 100-Year Floodplain, Depth <1 Foot; or Area Protected by Levee

- Zone X

FIGURE 3.9.2

SOURCE: Jacobs Engineering (02/2011); Thomas Brothers (2010); FEMA (08/2008): Eagle Aerial (03/2010)

0 0.5 1 Miles

FEMA 100-Year Floodplain Overview Map

08-RIV-MCP PM 0.0/16.3; 08-RIV-215 PM 28.0/34.3
EA 08-0F3200 (PN 0800000125)

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Storm Drain are designated as a floodway, which is defined as the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachments so that the 1 percent annual chance flood can be carried without substantial increases in flood heights. Just north of Ramona Expressway, the floodplain transitions to Zone A (special flood hazard areas subject to inundation by the 1 percent annual chance flood with no base flood elevations determined).

San Jacinto River

The San Jacinto River originates approximately 20.4 mi east-southeast of the study area in the San Jacinto Mountains and flows through the study area from the east. The section of the San Jacinto River floodplain that parallels the project study area has a natural curving watercourse that supports a moderate amount of vegetation, including native grasses, shrubs, and trees along the low-flow channel. The San Jacinto River floodplain is relatively wide (approximately 4,920 feet [ft]) and flat (slope less than 0.001) and is dominated by low brush grasses and farmland.

Near Lakeview Avenue, the Ramona Expressway crosses the San Jacinto River. At this location, north of the Ramona Expressway, the San Jacinto River is within a mapped Zone AE and shaded Zone X, with portions designed as a floodway. South of the Ramona Expressway, the floodplain is designated as Zone A.

The Ramona Expressway also crosses part of the San Jacinto River floodplain near State Route 79 (SR-79). At this location, the floodplain is designated as Zone A.

3.9.2.3 Beneficial Uses

Floodplains and wetlands in their natural or relatively undisturbed state serve water resource values (e.g., natural moderation of floods, water quality maintenance, and groundwater recharge), living resource values (e.g., fish, wildlife, and plant species), and cultural resource values (e.g., open space, archaeological, historical natural beauty, scientific study, outdoor education, and recreation). Beneficial uses for surfaces waters are defined in the *Santa Ana River Basin Water Quality Control Plan* (Santa Ana Regional Water Quality Control Board [RWQCB], 2008) as various ways that water can be used for the benefit of people and/or wildlife. Examples of beneficial uses include municipal and domestic water supply, agricultural water supply, industrial service supplies, industrial process supply, groundwater recharge, water contact recreation, non-contact water recreation, warm freshwater habitat, cold freshwater habitat, wildlife habitat, spawning habitat, and rare, threatened, or endangered species habitat.

The San Jacinto River within the study area has the following intermittent beneficial uses:

- Agricultural Supply
- Groundwater Recharge
- Water Contact Recreation
- Non-contact Water Recreation
- Warm Freshwater Habitat
- Wildlife Habitat

There are no defined beneficial uses within the MCP study area. Only intermittent uses have been defined within the study area, most likely because the water courses in the area experience seasonal, intermittent flow and are dry in the summer.

3.9.3 Environmental Consequences

3.9.3.1 Permanent Impacts

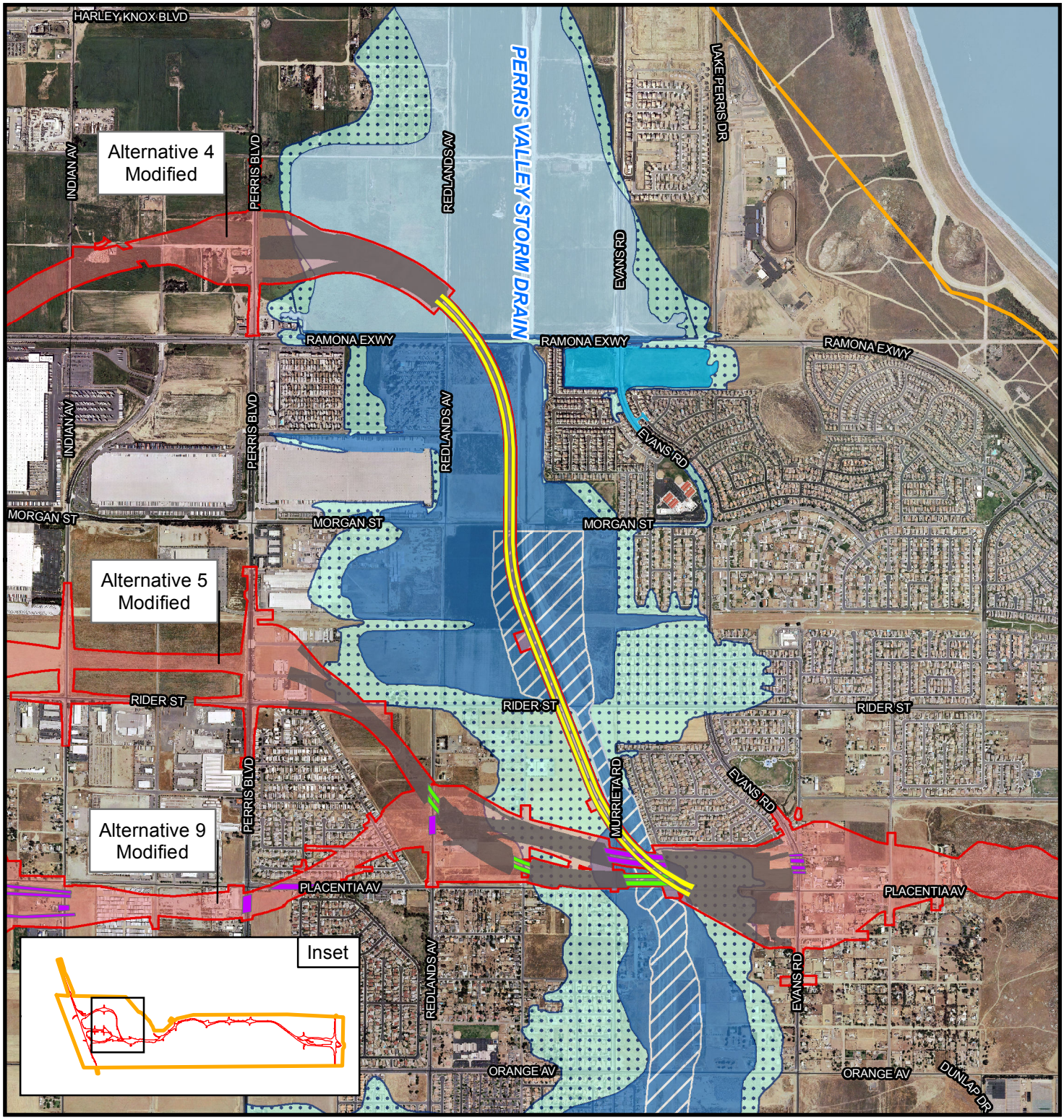
Build Alternatives

As described above, the MCP project alignments would cross floodplains in three locations; therefore, where applicable, these locations are discussed separately. The San Jacinto River Bridge Design Variation (SJRB DV) is also discussed separately.

Floodplain Encroachment

Perris Valley Storm Drain

The Alternative 4 Modified Alignment would parallel the Perris Valley Storm Drain floodplain/floodway between the Ramona Expressway and Placentia Avenue and would cross the Perris Valley Storm Drain floodplain/floodway near Placentia Avenue. That bridge location with respect to the floodplain/floodway is shown on Figure 3.9.3. The bridge columns would result in a longitudinal (i.e., parallel to the direction of flow) encroachment within the floodplain/floodway of the Perris Valley Storm Drain. The longitudinal encroachment would be the interim condition until the future levees planned for the Perris Valley Storm Drain are constructed. The Perris Valley Storm Drain levees are part of the long-term flood control plans for the City of Perris. If these levees were to be constructed prior to or concurrently with the MCP, Alternative 4 Modified at this location would be located outside the floodplain and would not result in a longitudinal encroachment. However, construction of the MCP project is not dependent on construction of the levees; therefore, Alternative 4 Modified would result in a longitudinal encroachment of the existing Perris Valley Storm Drain floodway/



LEGEND

FIGURE 3.9.3

- Limits of Proposed Improvements (All Alternatives and Design Variations)
- Study Area
- Bridges - Alternative 4
- Bridges - Alternative 5
- Bridges - Alternative 9

100-Year Floodplain

- Zone A
- Zone AE
- Zone AH
- Zone AO
- Floodway

500-Year Floodplain; 100-Year Floodplain, Depth <1 Foot; or Area Protected by Levee

- Zone X
- Grading Limit (Cut and Fill)

Note: Grading limits and bridges are only depicted for the portions of the project near or within a floodplain.

SOURCE: Jacobs Engineering (02/2011); Thomas Brothers (2010); FEMA (08/2008): Eagle Aerial (03/2010)

0 1000 2000 FEET

Floodplain - Perris Valley Storm Drain

08-RIV-MCP PM 0.0/16.3; 08-RIV-215 PM 28.0/34.3
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floodplain. The longitudinal encroachment is necessary to reduce the right-of-way take outside the floodway. Alternatives 5 Modified and 9 Modified, discussed below, are practicable alternatives to this longitudinal encroachment.

The Alternative 5 Modified and Alternative 9 Modified alignments would cross the Perris Valley Storm Drain floodplain/floodway near Placentia Avenue. Those bridge locations with respect to the floodplain/floodway are shown on Figure 3.9.3. There would be no longitudinal encroachment within the floodplain/floodway at this location because the bridges would span the Perris Valley Storm Drain at a skew angle of approximately 21 degrees with respect to the Perris Valley Storm Drain alignment. In addition, the bridges would be on columns for the length of the floodplain/floodway. No embankments would be constructed in the floodplain/floodway, and no longitudinal encroachment would occur under Alternative 5 Modified and Alternative 9 Modified.

San Jacinto River Bridge

The Alternative 4 Modified, Alternative 5 Modified, and Alternative 9 Modified Base Case alignments would cross the San Jacinto River floodplain near Lakeview Avenue (referred to as San Jacinto River Bridge in this analysis). Figure 2.3.1d, provided earlier in Chapter 2, Project Alternatives, shows the existing floodplain/floodway and the proposed bridge over the San Jacinto River. The 4,321 ft long San Jacinto River Bridge would be on columns for the entire length of the floodplain/floodway in this area. The proposed San Jacinto River Bridge would be a transverse (i.e., perpendicular to the direction of flow) crossing of the 100-year floodplain/floodway. Therefore, there would be no longitudinal encroachment within the floodplain/floodway of the San Jacinto River at this location.

San Jacinto River Bridge Design Variation

The SJRB DV would cross the San Jacinto River floodplain near Lakeview Avenue at the same location as the San Jacinto River Bridge design discussed above. Figure 2.3.1e, provided earlier in Chapter 2, Project Alternatives, shows the existing floodplain/floodway and the proposed bridge over the San Jacinto River under the SJRB DV. The SJRB DV would consist of a 531 ft long bridge on columns spanning Martin Street, a 1,941 ft long bridge on columns spanning the San Jacinto River, and 1,849 linear feet of fill on either end of the bridges totaling approximately 10 acres). The proposed SJRB DV would be a transverse (i.e., perpendicular to the direction of flow) crossing of the 100-year floodplain/

floodway. Therefore, there would be no longitudinal encroachment within the floodplain/floodway of the San Jacinto River at this location under the SJRB DV.

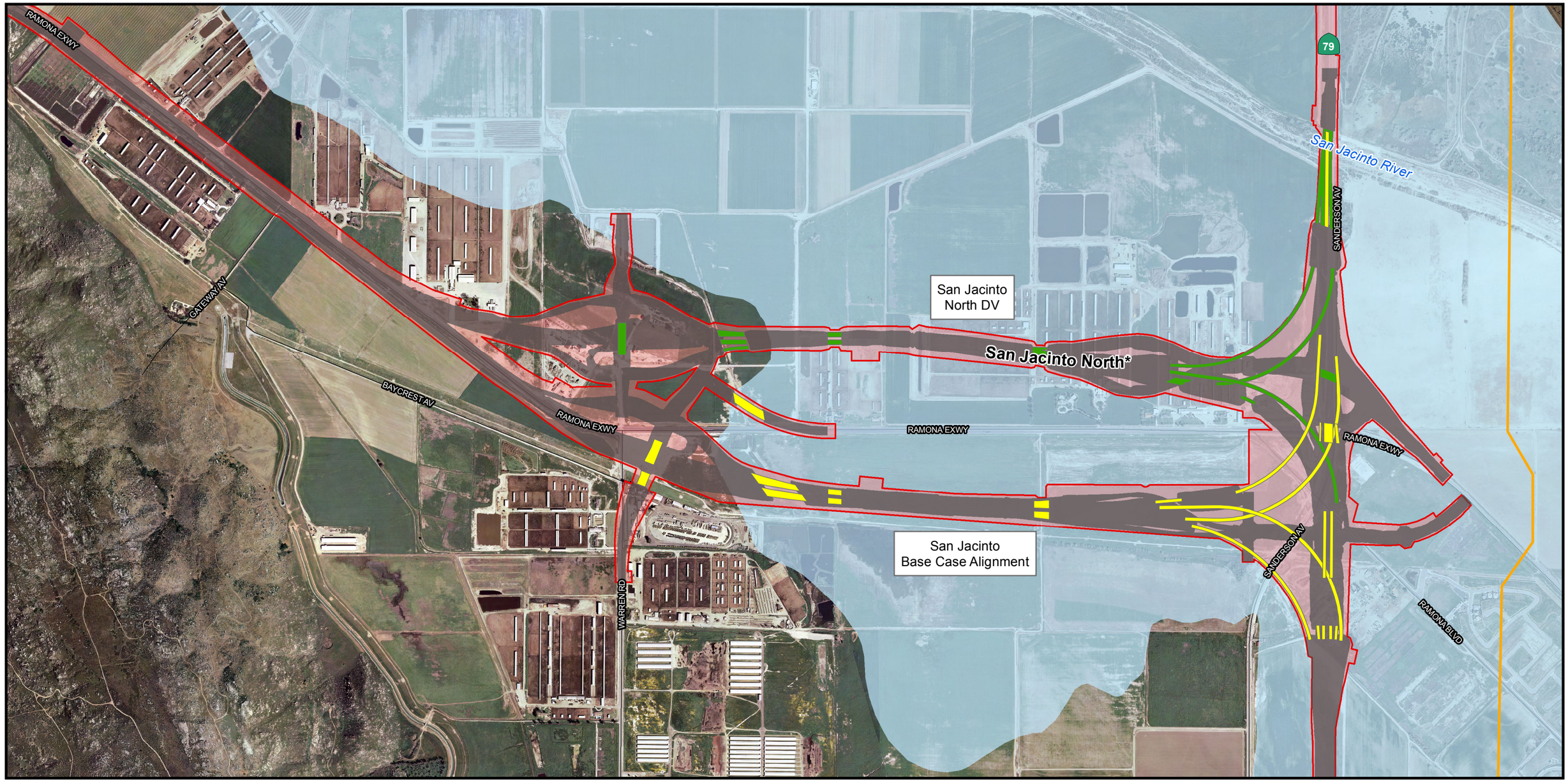
San Jacinto River at SR-79 Interchange

The Alternatives 4 Modified, 5 Modified, and 9 Modified alignments and the San Jacinto North Design Variation (SJN DV) would cross the San Jacinto River floodplain near the SR-79 interchange. Figure 3.9.4 shows the existing floodplain and the proposed roadway. Bridges, roadways, and embankments would be constructed within the 100-year floodplain at this location. The portion of the roadway that would be constructed on fill would longitudinally encroach into the existing 100-year floodplain of the San Jacinto River on an approximately 3 mi segment between SR-79 to just west of Warren Road. The longitudinal encroachment would be the interim condition until the future levees planned for the San Jacinto River are constructed. The San Jacinto River levee project is in the environmental planning phase, with the Draft EIR anticipated to be available for public review in late 2014. When these levees are constructed, the MCP project would be located outside the floodplain at this location and would no longer result in a longitudinal encroachment. However, construction of the MCP project is not dependent on construction of the levees; therefore, the Alternatives 4 Modified, 5 Modified, and 9 Modified alignments and the SJN DV would result in a longitudinal encroachment of the existing San Jacinto River floodplain near the SR-79 interchange. This portion of the MCP project is part of the construction necessary for the MCP project to meet its project purpose to provide a connection between and through the cities of Perris and San Jacinto. Several alternative alignments were considered during the preliminary concept design, including varying segments through San Jacinto. The MCP project has been designed to minimize impacts to floodplain values at this location. Therefore, the longitudinal encroachment is required to meet the MCP project goals.

Risks to Life and Property

Perris Valley Storm Drain

For the Alternative 4 Modified alignment, the proposed roadway along the Perris Valley Storm Drain would be constructed on an elevated structure (bridge) for the entire length of the floodplain/floodway in this area. However, bridge columns would be constructed within the 100-year floodplain/floodway. FEMA guidelines limit the water surface elevation increase to 1.0 ft within a floodplain and 0.0 ft within a floodway. This criteria was applied to design of the bridge crossing at



LEGEND

- Limits of Proposed Improvements (All Alternatives and Design Variations)
- Study Area
- Bridges - All Alternatives
- Bridges - Design Variation SJN

100-Year Floodplain

- Zone A
- Grading Limit (Cut and Fill)

* Design variation for all alternatives

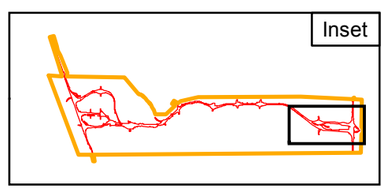


FIGURE 3.9.4

SOURCE: Jacobs Engineering (02/2011); Thomas Brothers (2010); FEMA (08/2008): Eagle Aerial (03/2010)

0 625 1250 FEET

Floodplain - San Jacinto River at SR-79 Interchange

08-RIV-MCP PM 0.0/16.3; 08-RIV-215 PM 28.0/34.3
EA 08-0F3200 (PN 0800000125)

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Perris Valley Storm Drain to ensure the bridge meets FEMA guidelines. The bridge columns would be designed such that implementation of the MCP project would result in an insignificant change in flood elevations and flood limits of the Perris Valley Storm Drain 100-year floodplain. The bridge would not be overtopped during the 100-year storm event, and no significant risk to life or property would occur. The minimum, basic National Flood Insurance Program (NFIP) floodplain management building requirements as listed in 44 Code of Federal Regulations Sections 59 through 65 will be met by the design of project structures in and near floodplains.

For the Alternatives 5 Modified and 9 Modified alignments, the proposed bridge over the Perris Valley Storm Drain would provide a minimum freeboard of 1.74 ft between the bottom of the bridge and the 100-year floodplain water surface elevation. As stated previously, the FEMA criteria was applied to design of the bridge crossing at Perris Valley Storm Drain to ensure the bridge meets FEMA guidelines for increasing water surface elevation. The maximum increase in water surface elevation of the 100-year floodplain would be 0.49 ft. However, the 100-year flood would continue to be contained within the Perris Valley Storm Drain. The bridge would not be overtopped during the 100-year storm event, and no significant risk to life or property would occur due to flooding.

For all Build Alternatives, detailed analyses would be conducted during final design to estimate the potential pier scour depths and determine the pier depth required to prevent toppling or damage of the bridge structures during flooding (the current 35 percent design level is not detailed enough to estimate scour depths). In addition, the bridge structures would be designed to the Caltrans seismic design criteria. Bridge-type selection and foundation design would ensure the bridge structure would be safe under a 100-year flood. Therefore, no significant risk to life or property would occur due to toppling or damage to the proposed bridge structures.

Based on the assessment of level of risk in the Location Hydraulic Studies, the encroachments in the Perris Valley Storm Drain are considered “low” risk.

San Jacinto River Bridge

For the Alternatives 4 Modified, 5 Modified, and 9 Modified alignments, the proposed bridge over the San Jacinto River at Lakeview would provide a minimum freeboard of 1.15 ft between the bottom of the bridge and the 100-year

water surface elevation. Therefore, the bridge would not be overtopped during the 100-year storm event. FEMA guidelines limit the water surface elevation increase to 1.0 ft within a floodplain and 0.0 ft within a floodway. This criteria was applied to the design of the bridge crossing at the San Jacinto River to ensure the bridge meets FEMA guidelines. The maximum increase in water surface elevation of the 100-year floodplain would be 0.066 ft, and the 100-year flood would continue to be contained within the San Jacinto River. In addition, no structures are located within the floodplain in this area, and the minimal increase in water surface elevation would not put any structures at risk of flooding. Therefore, no significant risk to life or property would occur at this location due to flooding. The minimum, basic National Flood Insurance Program (NFIP) floodplain management building requirements as listed in 44 Code of Federal Regulations Sections 59 through 65 will be met by the design of project structures in and near floodplains.

For all Build Alternatives, detailed analyses would be conducted during final design to estimate the potential pier scour depths and determine the pier depth required to prevent toppling or damage of the bridge structures during flooding (the current 35 percent design level is not detailed enough to estimate scour depths). In addition, the bridge structures would be designed to the Caltrans seismic design criteria. Bridge-type selection and foundation design would ensure the bridge structure would be safe under a 100-year flood. Therefore, no significant risk to life or property would occur due to toppling or damage to the proposed bridge structures.

Based on the assessment of level of risk in the Location Hydraulic Studies, the encroachments in the San Jacinto River due to construction of the San Jacinto River Bridge are considered “low” risk.

San Jacinto River Bridge Design Variation

For the SJRB DV, the proposed bridge over the San Jacinto River at Lakeview would provide a minimum freeboard of 1.08 ft between the bottom of the bridge and the 100-year water surface elevation. Therefore, the bridge would not be overtopped during the 100-year storm event. FEMA guidelines limit the water surface elevation increase to 1.0 ft within a floodplain and 0.0 ft within a floodway, This criteria was applied to design of the bridge crossing at the San Jacinto River to ensure the bridge meets FEMA guidelines. The maximum increase in water surface elevation of the 100-year floodplain would be 0.66 ft,

and the 100-year flood would continue to be contained within the San Jacinto River. In addition, no structures are located within the floodplain in this area, and the minimal increase in water surface elevation would not put any structures at risk of flooding. Therefore, no significant risk to life or property would occur at this location due to flooding. The minimum, basic National Flood Insurance Program (NFIP) floodplain management building requirements as listed in 44 Code of Federal Regulations Sections 59 through 65 will be met by the design of project structures in and near floodplains.

To assess the potential effect of the floodplain encroachment on the river upstream and downstream of the proposed bridge, the existing and proposed bridge conditions are explained below in more detail. Three distinct areas were analyzed, and the results of that analysis are summarized below. Additional detail is provided in Appendix M, Mid County Parkway Preferred Alternative/LEDPA (NEPA/404 Checkpoint 3) (December 19, 2013).

First, there is the area upstream (north) of the existing Ramona Expressway Bridge (this existing bridge will not be modified by the MCP project). The 100-year floodplain for the area upstream of the MCP crossing of the San Jacinto River goes into the San Jacinto Wildlife Area. For that area, the analysis determined that there would be a maximum of 0.16 ft of water surface elevation (WSE) change as a result of the SJRB DV. The water surface upstream of the existing Ramona Expressway Bridge would rise a maximum of 0.16 ft, and the flow velocity would decrease by a maximum of approximately 0.6 feet per second (fps) for a reach spanning approximately 82 ft upstream of the existing bridge structure. The rise in water surface would be minimal. A 0.16 ft (1.9-inch) rise in flow depth in a 100-year event represents a 1.3 percent increase in calculated flow depth. This small increase would not be observable in a 100-year event. This calculation is the numerical difference in a hydraulic model that is beyond the precision warranted for a river system the size of the San Jacinto River. However, the corresponding decrease in flow velocity represents a 9 percent reduction in the erosive potential of the river. The reduced flow velocity reduces the erosive potential of flow upstream of the existing Ramona Expressway. A 2008 study by the United States Department of the Interior, Bureau of Reclamation (*Upper San Jacinto River Sediment Transport Study, San Jacinto, CA*) indicates that 6,000 tons of bed material are deposited in the area of the river between Lake Park Drive and Bridge Street in an average year of river flow due to the existing concave bed profile. This equates to 90 percent of the sediment transported from

the upper watershed. Therefore, it would be expected that the river would have an increased sediment-carrying capacity downstream of Bridge Street and thus, the relative decrease in flow rate that would result from the Design Variation bridge would reduce the erosion potential of the river, producing this project-related benefit.

The second distinct area of study occurs downstream of the proposed SJRB DV. This area would not experience any change in WSE and flow rate/velocity as a result of the SJRB DV. The behavior of the water downstream of the SJRB DV is controlled by the existing Ramona Expressway Bridge, which would remain in place and would not be changed by the MCP project. Therefore, because of the existing Ramona Expressway Bridge, there would be no discernible change in the water levels or water footprint as a result of the fill needed to construct the SJRB DV. In the existing and proposed (i.e., with SJRB DV) conditions, the area downstream of the proposed SJRB DV has a flow depth of approximately 8.73 ft and a flow velocity of 2.4 fps. There would be no change to the downstream conditions with the SJRB DV and, therefore, there would be no change to biological resources downstream of the SJRB DV.

The third area of study occurs in the area between the existing Ramona Expressway Bridge and the proposed SJRB DV. This area is approximately 4,000 ft long and approximately 118 ft wide in the area between these two bridges. This area would be affected by abutments for the SJRB DV and would experience a WSE rise of 3.2 ft although this increase would only occur in a 26 ft area upstream of the proposed SJRB DV and downstream of the existing Ramona Expressway Bridge. This area would also experience a WSE elevation change, which would be a benefit as the flow velocity would be decreased by 4.3 fps and would reduce the erosive potential of the San Jacinto River during a 100-year event.

For all Build Alternatives, detailed analyses would be conducted during final design to estimate the potential pier scour depths and determine the pier depth required to prevent toppling or damage of the bridge structures during flooding (the current 35 percent design level is not detailed enough to estimate scour depths). In addition, the bridge structures would be designed to the Caltrans seismic design criteria. Bridge-type selection and foundation design would ensure the bridge structure would be safe under a 100-year flood. Therefore, no significant risk to life or property would occur due to toppling or damage to the

proposed bridge structures. Additional analyses of high flow events were conducted as part of the NEPA/404 Checkpoint 3 LEDPA process discussed in detail in Appendix M.

In the proposed condition with the MCP project, the flow will overtop the existing Ramona Expressway as it does today. When the flow encounters the proposed Base Case or SJRB DV bridge, it will flow between the bridge piers and the bridge abutments, and will flow beneath the bridge deck. The hydraulic model does not indicate that there will be any overtopping of the analyzed flow rates for either proposed bridge in a storm event up to and including the 100-year storm event. As a result of flow friction and reduced flow area from the proposed bridge piers, the flow velocity is reduced as it flows beneath the proposed bridge. As a result of the reduced flow velocity, the flow depth increases slightly compared to the existing condition. The calculated reduction in flow velocity and increase in flow depth is limited to the area between the existing Ramona Expressway and the proposed bridge for the 10-year and 25-year storm events. In a 100-year event, the design variation bridge results in a calculated increase in the water surface elevation of 0.1 meter (3.9 inches). This increase extends approximately 7 meters (23 ft) upstream of the existing Ramona Expressway bridge.

The peak discharge of storm water runoff is defined as “Q.” The 10-year Q is 127.4 cubic meters per second (cms) (approximately 4,500 cubic feet per second [cfs]); 25-year Q is 274.7 cms (approximately 9,700 cfs). A review of the existing United States Geological Survey (USGS) stream gauge 1107210 historical data for the San Jacinto River at Ramona Expressway indicates that there have only been five gauge readings above 0.0 cfs at this location since 2001. The readings were, 2.7 cfs, 0.19 cfs, 3.6 cfs, 19 cfs, and 3 cfs. This seems to indicate that the lower return interval events (2-year and 5-year, etc.) do not produce sufficient volume to result in measurable flow in the San Jacinto River. In addition, there is insufficient historical gauge data to provide a statistical analysis of the readings to generate the other requested corresponding storm frequency flow rates.

Based on the assessment of level of risk in the Location Hydraulic Studies and as described above, the encroachments in the San Jacinto River due to construction of the SJRB DV are considered “low” risk.

San Jacinto River at SR-79 Interchange

The Alternatives 4 Modified, 5 Modified, and 9 Modified alignments and the SJN DV would result in construction of bridges, roadways, and embankments within the 100-year floodplain that would cause an increase in the 100-year water surface elevation. The roadway would be constructed on fill approximately 8 to 10 ft above the existing ground. The proposed roadway would provide a minimum freeboard of 3 ft between the roadway and the 100-year water surface elevation. The proposed bridges would provide a minimum freeboard between the 100-year water surface elevation and the proposed soffit elevation of 0.92 ft for the Alternatives 4 Modified, 5 Modified, and 9 Modified alignments and 0.76 ft for the SJN DV. FEMA guidelines limit the water surface elevation increase to 1.0 ft within a floodplain, This criteria was applied to design of the bridge crossing at the San Jacinto River to ensure the bridge meets FEMA guidelines. The portions of the MCP that are not within a major flow path of the river, but are still within the 100-year floodplain, are typically on fill. Within these areas, cross-culverts are proposed to follow the existing flow paths and avoid an increase in water surface elevation. The maximum increase in water surface elevation along this segment would be 0.10 ft for the Alternatives 4 Modified, 5 Modified, and 9 Modified alignments and 0.35 ft for the SJN DV. The 100-year flood would continue to be contained within the San Jacinto River. This increase in the 100-year water surface elevation is minimal and would not pose a significant risk to existing structures in the floodplain. Therefore, no significant risk to life or property would occur at this location due to flooding. The minimum, basic National Flood Insurance Program (NFIP) floodplain management building requirements as listed in 44 Code of Federal Regulations Parts 59 through 65 will be met by the design of project structures in and near floodplains.

For all Build Alternatives, detailed analyses would be conducted during final design to estimate the potential pier scour depths and determine the pier depth required to prevent toppling or damage of the bridge structures during flooding (the current 35 percent design level is not detailed enough to estimate scour depths). In addition, the bridge structures would be designed to the Caltrans seismic design criteria. Bridge-type selection and foundation design would ensure the bridge structure would be safe under a 100-year flood. Therefore, no significant risk to life or property would occur due to toppling or damage to the proposed bridge structures.

Based on the assessment of level of risk in the Location Hydraulic Studies, the encroachments in the San Jacinto River near SR-79 are considered "low" risk.

Conditional Letter of Map Revision/Letter of Map Revision

Although the MCP Build Alternatives would result in encroachments into designated floodplains/floodways as described earlier, those encroachments are considered to be "low" risk and do not present a significant risk to life or property. Nonetheless, because the MCP Build Alternatives would result in minor changes in the floodplains/floodways, revisions to the FEMA FIRMs would be necessary to ensure that those maps properly reflect the floodplain/floodway conditions with the changes that would occur as a result of the MCP Build Alternatives. As a result, an application for a Conditional Letter of Map Revision and Letter of Map Revision from RCTC to FEMA and the Riverside County Flood Control and Water Conservation District would be required.

Final Location Hydraulic Studies will be prepared during final design. The change in floodplain/floodway elevations and results of the MCP Project will be refined based on final design plans of the bridges and roadway where they encroach on the 100-year floodplain/floodway. The refined modeling results would be included in the application for the Conditional Letter of Map Revision and Letter of Map Revision. Although the FIRM map revisions would not avoid or reduce the physical impact of the MCP Build Alternatives on floodplains/floodways, they would protect the public by ensuring that the FIRMs for the affected areas are current and properly reflect potential flood water elevations with the effects of the MCP Build Alternatives.

In the event the Perris Valley Storm Drain and San Jacinto River levee projects are constructed prior to construction of the MCP project, a Conditional Letter of Map Revision and Letter of Map Revision would no longer be required for the MCP Project.

Emergency Response

The new bridge crossings are located on the MCP alignment (not on Ramona Expressway) and, therefore, should result in minimal road and detours on Ramona Expressway. Fire and emergency service providers may experience detours or limited access to the study area during construction. As a result, there may be an increase in emergency response times during construction. At least one lane in each direction would remain open on the Ramona Expressway during project construction. All

temporary lane closures and detours would be coordinated with local emergency and jurisdictions to minimize temporary delays in response times.

During operation, the MCP project would improve the transportation network in the area and would alleviate existing service interruptions caused by flooding. The MCP project would enhance the ability to move fire protection and emergency service resources from one area to another by providing a high capacity multi-lane roadway facility. The proposed project would not result in interruption of emergency services or routes and would improve access throughout the region during a flood event.

Natural and Beneficial Floodplain Values

Potential impacts to natural and beneficial floodplain values include direct impacts caused by operation of the project. Best Management Practices (BMPs) would be implemented during the construction and operation of the proposed project to reduce impacts to the intermittent beneficial uses of the San Jacinto River. Earthen-channel bottoms would be retained to the extent practical to provide flood protection for adjacent areas. Compensatory mitigation for impacts to wetlands and other floodplain values would help to reduce potential impacts to natural and beneficial floodplain values. Therefore, implementation of the proposed project would not result in substantial impacts to natural and beneficial floodplain values.

The SJRB DV would place 1,849 linear feet of fill on either end of the bridges within the San Jacinto River. Although the fill would be located within the mapped 100-year floodplain/floodway of the San Jacinto River, it would not substantially modify the hydrology or hydraulics of the river as described earlier. This is because the existing Ramona Expressway Bridge currently constrains the 10 and 25 year flows of the San Jacinto River, and during the 100-year events, the river flows over the top of the existing bridge. Under the SJRB DV, the existing bridge will remain in place, still providing the control to the movement of water upstream from it. The 1,849 linear feet of fill associated with the SJRB DV results in negligible changes to the water surface elevation associated with the 100-year event. Based on the analysis results described above, because there would be negligible changes to the velocity and WSE elevations upstream of the existing Ramona Expressway Bridge and no observable difference in the downstream portion of the proposed SJRB DV from the existing 100-year conditions without the project, there would not be any expected impacts to the existing biological resources (i.e., plants) in those areas. For the area between the existing Ramona Expressway Bridge and the proposed SJRB DV, there would be an increase in land that is currently not underwater that would be

underwater during a 100-year event. RCTC will provide mitigation for the loss of area that supports habitat suitable for long-term conservation for San Jacinto Valley crownscale, spreading navarretia, Coulter's goldfields, and smooth tarplant (as shown later on Figure 3.17.3), as well as for alkali communities in the San Jacinto River floodplain at Lakeview.

The potential for flooding within the San Jacinto Wildlife Area was also analyzed. The calculated increase in flow depth in a 100-year event is 0.1 meter (10 centimeters or 3.9 inches). The result of the increase in flow depth is an increase in the surface area wetted by approximately 215 square feet. It should be noted that hydrology is an imprecise science. It is probability-based and produces hydrograph ordinates in confidence interval bins. In a high-confidence hydrology analysis, there is typically a 90 percent confidence probability that calculated flow rate for a 100-year event is within 5 percent of calculated value. Therefore, hydraulic analysis with decimal fraction precision is unwarranted and can be misleading. Because this analysis compares events with 1 percent chance exceedance (100-year) and at best a 90 percent confidence accuracy interval, a 10-centimeter differential in calculated water surface elevation is negligible in a watershed the size of the San Jacinto River watershed. Also, while peak flow rates are thought of as constant, in actuality, they are instantaneous and only last for a moment on a flood wave (runoff hydrograph). The level of precision that can be attained estimates that the peak flow would last typically anywhere from 1 to 30 minutes for a hydrograph resulting from mountainous terrain such as the San Jacinto Mountains. In a very large watershed such as the San Jacinto River watershed, the peak flow rate duration would be closer to 30 minutes than 1 minute and probably around 20 minutes. Therefore, the additional 20-square-meter area that may be wetted by the 0.1-meter rise in water surface would be wetted for approximately 20 to 30 minutes.

Based on the analyses discussed above, implementation of the SJRB DV would not result in substantial impacts to natural and beneficial floodplain values, including any flooding within the San Jacinto Wildlife Area.

Significant Encroachment

A "significant encroachment," as defined in 23 CFR, Section 650.105(q), is a highway encroachment that would result in (1) a significant potential for interruption or termination of a transportation facility that is needed for emergency vehicles or provides a community's only evacuation route, (2) a significant risk, or (3) a significant adverse impact on natural and beneficial floodplain values. The proposed

action does not constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q) based on the analysis of the project effects on floodplains/ floodways described earlier. The proposed project would result in an insignificant change in the capacity of the San Jacinto River and Perris Valley Storm Drain to carry water and would improve existing flooding conditions in the project area. The proposed MCP project would cause a minimal increase in flood heights and flood limits. This minimal increase would not result in any significant adverse impacts on the natural and beneficial floodplain values, would not result in any significant change in flood risks or damage, and does not have significant potential for interruption or termination of emergency service or emergency routes. Therefore, the proposed encroachment is not significant.

No Build Alternatives

Floodplain Encroachment

Under Alternative 1A, the MCP project would not be constructed. Planned improvements in the regional and local circulation system, as accounted for in the adopted Riverside County General Plan, RCTC's Measure A program, and other adopted plans and policies, would be implemented assuming 2040 land use conditions. Alternative 1B is the same as Alternative 1A but includes implementation of Ramona Expressway, consistent with the Riverside County General Plan Circulation Element.

Individual projects in the MCP No Build Alternatives may result in floodplain encroachments. New roadway projects such as the SR-79 Realignment Project would likely result in similar impacts to existing floodplains as those identified for the MCP Build Alternatives, while projects that widen existing facilities (e.g., I-215 widening projects) are less likely to result in floodplain encroachments.

Emergency Response

The MCP No Build Alternatives would not have the beneficial effect of alleviating existing transportation service interruptions caused by flooding. Although some projects included in the MCP No Build Alternatives may enhance the ability to move fire protection and emergency service resources from one area to another, they would not provide the benefit of a regional transportation facility like the MCP project.

Risks to Life or Property

The MCP No Build Alternatives include improvements to the transportation network and would likely improve existing flooding conditions in areas where existing roadway encroachments into existing floodplains are improved.

Natural and Beneficial Floodplain Values

Under the MCP No Build Alternatives, impacts to natural and beneficial floodplain values include direct impacts caused by grading, construction, and operation of the projects proposed in the city and county General Plan Circulation Elements. For these projects, it is assumed that proposed bridge abutments and piers would be located to avoid or minimize impacts to jurisdictional waters of the United States to the greatest extent feasible, thus preserving natural resource values. Compensatory mitigation for impacts to wetlands and other floodplain values would be required by regulatory agencies to reduce impacts to water resource beneficial floodplain values. In addition, earthen-channel bottoms would be retained to the extent practical to provide flood protection for adjacent areas. Therefore, implementation of the MCP No Build Alternatives is not expected to result in substantial impacts to natural and beneficial floodplain values.

3.9.3.2 Temporary Impacts

Build Alternatives

Potential impacts to natural and beneficial floodplain values include direct impacts caused by grading and construction. BMPs would be implemented during construction of the proposed project to reduce impacts to the intermittent beneficial uses of the San Jacinto River. Compensatory mitigation for impacts to wetlands and other floodplain values would help to reduce potential impacts to natural and beneficial floodplain values. Therefore, implementation of the proposed project would not result in substantial impacts to natural and beneficial floodplain values.

No Build Alternatives

Under the MCP No Build Alternatives, the MCP project would not be constructed and temporary impacts to hydrology and floodplains would not occur. However, construction of other projects that would occur under the MCP No Build Alternatives would result in similar temporary impacts to those described for the MCP project.

3.9.4 Avoidance, Minimization, and/or Mitigation Measures

The following condition is required for Alternatives 4 Modified, 5 Modified, and 9 Modified with or without the SJN DV or the SJRB DV to modify the FEMA FIRMS to reflect the project impacts to 100-year floodplains/floodways.

FP-1 **Conditional Letter of Map Revision and Letter of Map Revision.** During final project design, and prior to the issuance of any grading permits, for any parts of the Mid County Parkway (MCP) project located in a 100-year floodplain/floodway, the Riverside County Transportation Commission (RCTC) Project Manager shall process a Conditional Letter of Map Revision and a Letter of Map Revision for the floodplain and floodway encroachments through the Riverside County Flood Control and Water Conservation District (FC&WCD) and Federal Emergency Management Agency (FEMA) if the Perris Valley Storm Drain and the San Jacinto River levee projects are not constructed prior to construction of the MCP project. The information provided to the Riverside County FC&WCD and FEMA shall include the final detailed applications, certification forms, hydraulic analyses (i.e., Final Location Hydraulic Studies), and fee payment to FEMA to obtain a Conditional Letter of Map Revision and a Letter of Map Revision. Any parts of the MCP project located within a 100-year floodplain/floodway shall not be constructed until the Letter of Map Revision is approved by the Riverside County FC&WCD and FEMA.

In addition to the measure listed above, compensatory mitigation for impacts to wetlands and other floodplain values would help to reduce impacts to water resource beneficial floodplain values, as described in Section 3.18, Wetlands and Other Waters.

Water quality BMPs would be used to lessen impacts to water quality and beneficial uses, as described in Section 3.10, Water Quality and Storm Water Runoff.